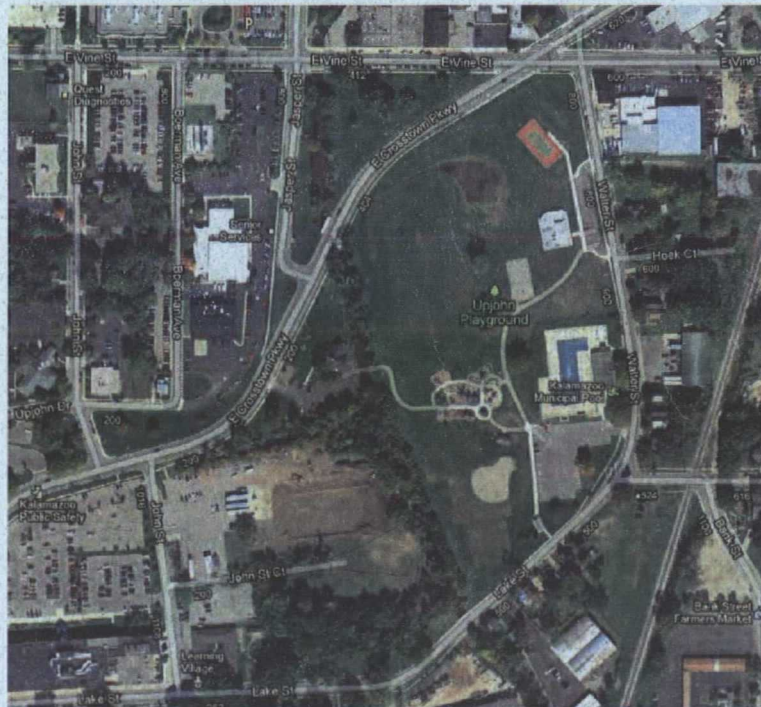




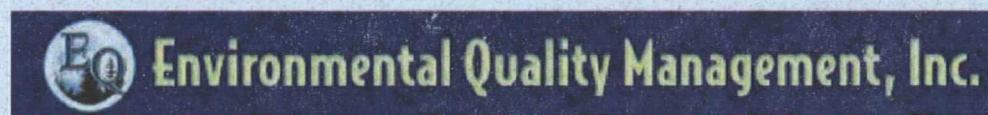
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Portage Creek Sediment Remediation Project Kalamazoo, Michigan

Pre-Sediment Removal Structure Feature Assessment
Removal Areas SA5-Axtell, SA5-D and SA5-C



Prepared For:



Prepared By:



F&V Project Number: 809930
May, 2012

General Notes:

- The following list of structures was generated based on a field review of the removal area supplemented with a review of available construction records. It may not be an exhaustive list of constructed features in the removal area. If additional constructed features are encountered during sediment removal operations, F&V should be notified of the discovery to allow for review of their potential impact on the project.
- Pre-Sediment Removal review was focused on the channel and bank areas, including structures potentially impacted directly by the removal of sediment. There are other structures in the general project area which should be avoided or protected from damage from construction equipment during removal and transportation of sediment.
- As is the case when undertaking any underground work, Miss Dig should be contacted to locate active utilities in the project area prior to commencing removal operations.

Designation: SA5-Axtell-S01

Location: SA5-Axtell-S01 is the concrete outlet control structure just east of John Street.

Description: SA5-Axtell-S01 is a cast in place concrete outlet control structure consisting of headwall and wingwalls. The structure supports the slope behind where Axtell Creek transitions from closed conduit (culverts) to an open channel. The culverts are submerged below the normal water line.

Pre-existing Condition:

- Moderate slope erosion was noted behind the headwall and wingwalls.
- There is a large plunge pool/scour hole just downstream of the outlet.
- The structure includes a pipe penetration (possibly a storm water force main?) through the south wingwall. The pipe has moderate surface corrosion.
- Although the depth of the channel at the structure makes probing difficult, some slight undermining of the culverts is suspected due to the depth of scour.
- The concrete is in fair condition with no noticeable cracking.
- The concrete slope protection in front of the wingwalls is severely undermined from bank erosion.

Protective Measures:

- To avoid disturbance of the structure during sheet pile installation, it is recommended that the cofferdam be kept approximately 8-10' from the headwall (4-6' from the end of the wingwalls). If excavation is required closer to the structure, a sand bag cofferdam should be considered.



Structure viewed from the north bank



Elevation view of the structure



Slope erosion behind the north wingwall



Pipe penetration in south wingwall and undermined concrete

Designation: SA5-Axtell-S02

Location: SA5-Axtell-S02 is the fence parallel to Axtell Creek along the top of the south bank.

Description: SA5-Axtell-S02 is a chain link fence with concrete bases.

Pre-existing Condition:

- A portion of the fence along the EQM Primary Support Area had been removed and replaced with construction fencing at the time of evaluation.
- An area of bank erosion has exposed a concrete base just downstream of the outlet structure.
- The fence is overgrown with vegetation in several areas.

Protective Measures:

- Remove the fencing and replace in kind as required to facilitate sediment removal.



Bank erosion just downstream of control structure



Concrete base exposed by bank erosion



Area of fencing overgrown with vegetation

Designation: SA5-Axtell-S03

Location: SA5-Axtell-S03 is the curb parallel to Axtell Creek at the top of the south bank at the west end of SA5-Axtell.

Description: SA5-Axtell-S03 is a concrete curb structure

Pre-existing Condition:

- The curb is generally in fair condition, however it has vegetation growth through several joints.
- An area of bank erosion has exposed the back of curb just downstream of the outlet structure, threatening to undermine the curb.

Protective Measures:

- Protect the curb during sediment removal. Repair or replace undermined or broken sections of curb as required.
- Maintain approximately 2 feet of clearance from end of sheet pile cofferdam to curb.



Bank erosion exposing back of curb and vegetation growth

Designation: SA5-Axtell-S04

Location: SA5-Axtell-S04 is the bumper rail parallel to Axtell Creek adjacent to the Primary Support Area.

Description: SA5-Axtell-S04 is a steel bumper rail consisting of square tube posts and rail.

Pre-existing Condition:

- The steel rail and posts have minor surface corrosion.
- Several posts have been exposed from bank erosion.
- Several rail sections have failed.

Protective Measures:

- Protect the rail during sediment removal or remove and replace in kind as required.
- Because the parcel is currently vacant, it may be possible to contact the City of Kalamazoo and remove the rail entirely.



Failed section of rail and surface corrosion on rail



View of the rail looking east



Failed section of rail and surface corrosion on rail



Post being exposed by bank erosion



View of the rail looking east

Designation: SA5-Axtell-S05

Location: SA5-Axtell-S05 is the asphalt pavement at the top of the south bank along Axtell Creek.

Description: SA5-Axtell-S05 is hot mixed asphalt pavement from previous development on the site.

Pre-existing Condition:

- The asphalt has significant cracking throughout with vegetation growth through cracks.
- The edge of pavement is spalled in several locations from progressing bank erosion.

Protective Measures:

- Protect the pavement during sediment removal and repair as required.



Typical cracking and spalling of asphalt pavement

Designation: SA5-Axtell-S06

Location: SA5-Axtell-S06 is located on the south bank of Axtell Creek approximately 100' east of the outlet structure.

Description: SA5-Axtell-S06 is a concrete spillway for runoff from the asphalt parking lot at the top of the south bank.

Pre-existing Condition:

- The spillway has failed from progressed bank erosion and a large tree. Just a portion of the original spillway remains and is no longer connected to the asphalt pavement.
- The spillway is severely undermined and spalled with a hole through the west side.

Protective Measures:

- Because the spillway is no longer functional it can likely be removed and eliminated.



View of the spillway from the channel



View of the spillway from the upstream channel



View of the spillway from the downstream channel

Designation: SA5-Axtell-S07

Location: SA5-Axtell-S07 is located on the north bank of Axtell Creek approximately 150' east of the outlet structure.

Description: SA5-Axtell-S07 is a 12" clay storm sewer pipe from the Crosstown Parkway area.

Pre-existing Condition:

- The last 4 sections of pipe (~8') have failed from severe bank erosion. The bank has cut back ~12-18" on the fifth section.
- There is a sink hole and cracked bell on the 6th section, approximately 4' from the water's edge.

Protective Measures:

- Remove the 4 failed sections of pipe in the channel.
- Protect the remaining pipe with an isolation cofferdam to allow for dewatering. Provide approximately 2-3' of clearance between the cofferdam and end of pipe.



View of the structure from the upstream channel



Fifth section exposed by bank erosion and failed fourth section



View of the structure from the downstream channel



Previous concrete protection on the downstream side of the pipe



Sink hole at cracked bell section in the bank area



Overall view of structure from bank area

Designation: SA5-Axtell-S08

Location: SA5-Axtell-S08 is located on the south bank of Axtell Creek approximately 200' east of the outlet structure.

Description: SA5-Axtell-S08 is a concrete spillway for runoff from the asphalt parking lot at the top of the south bank.

Pre-existing Condition:

- The structure is in poor condition, nearly failed.
- The end of the spillway is severely undermined from bank erosion.
- The concrete has cracked allowing the end to slough down into the channel area leaving a ~2' gap in paving.

Protective Measures:

- Because the spillway no longer appears to be functional, it can likely be removed and eliminated.



View of the structure from the upstream bank



Concrete cracked and separated on left and covered with debris elsewhere



Separation between spillway and asphalt parking area



End section sloughed into the channel and undermined



Close-up of structure from channel

Designation: SA5-D-S01

Location: SA5-D-S01 is the Lake Street Bridge over Portage Creek just south of the removal limits for SA5-D.

Description: SA5-D-S01 is a single span bridge constructed in 1986. The superstructure is composed of side by side prestressed concrete box beams, concrete sidewalks, concrete parapet railings and an asphalt wearing surface. The substructure is composed of concrete curtain walls supported on cast in place concrete piles. Concrete block type retaining walls were constructed in all 4 quadrants to support the slopes.

Pre-existing Condition:

- Refer to the feature assessment for area SA6 (structure SA6-S20), as the Lake Street Bridge represents the dividing line between the two areas.

Protective Measures:

- We understand that the northernmost cofferdam for SA6 is to be a sand bag wall to avoid impacting the wingwall extensions. A similar installation is recommended for the southernmost cofferdam for SA5-D.
- Two utility crossings were identified on the north side of the Lake Street bridge. The first is a water main, which is easily identified as it is supported on the north fascia and will not conflict with excavation work. The second is a 6" gas main identified on the Consumers Energy mapping. It appears that this crossing is beneath the creek bed parallel to Lake Street, fairly close to the north fascia. Because of MDEQ requirements, it is likely a minimum of 5' below the bottom of channel (assuming it was directionally drilled, 3' if it was open cut). If Miss Dig flagging places the gas main within the excavation limits, it should be hand excavated to either expose the main and confirm its depth or to a depth 12" below the intended excavation. Because Miss Dig flagging is typically accurate to within 18", any sheet pile should be installed with a minimum clearance of 2' from the gas main location.



Elevation view of the structure from the downstream channel

Designation: SA5-D-S02

Location: SA5-D-S02 is located on the east bank of Portage Creek approximately 50' north of Lake Street.

Description: SA5-D-S02 is a concrete rubble wall consisting of large slabs of salvaged concrete.

Pre-existing Condition:

- Several of the slabs are failed or failing from cracking and undermining.
- The structure has severe tree growth and root intrusion, which is causing movement of the slabs.

Protective Measures:

- The structure appears to have been installed to protect an isolated area of excessive bank erosion. Either place a sand bag wall to protect the structure from further undermining or remove it and restore the bank area.



View of structure from upstream channel



View of structure from channel



Cracked, undermined and failing concrete slabs



Cracked, undermined and failing concrete slabs

Designation: SA5-D-S03

Location: SA5-D-S03 is located on the west bank of Portage Creek approximately 100' north of Lake Street.

Description: SA5-D-S03 is a small concrete wall, approximately 12" thick.

Pre-existing Condition:

- The bank is severely eroded, approximately 4' behind the wall.
- The wall has severe tree and root growth behind it.
- The concrete surface has moderate abrasion and spalling along the waterline.
- Several sink holes and a partially exposed steel pipe were noted in the bank behind the structure.

Protective Measures:

- The purpose of the structure is not evident and it no longer appears to be functional. It can likely be removed.



View of structure from the channel



Severe bank erosion around the south end of the wall



Abrasion and spalling along the waterline



Severe tree and root growth behind the wall



Severe bank erosion behind north end of wall



Sink hole with exposed steel pipe in the northwest bank area



Close-up of sinkhole and steel pipe

Designation: SA5-D-S04

Location: SA5-D-S04 is located on the banks of Portage Creek approximately 125' north of Lake Street.

Description: SA5-D-S04 is the remains of a previous bridge crossing. Each bank has a concrete abutment and a failed or failing concrete post. The superstructure has failed or been removed previously.

Pre-existing Condition:

- Severe bank erosion was noted around the northeast, southeast and northwest and minor erosion in the southwest, however no undermining was detected.
- A severely spalled concrete post remains in the northeast and there is a failed concrete post on the southwest slope area.
- The concrete is in fair condition with shallow spalling and scaling as well as scattered cracking noted.

Protective Measures:

- Because the structure has been abandoned, it can likely be removed. However, it is recommended that the City of Kalamazoo be consulted to verify as it may be feasible to salvage the abutments for a future crossing at this location.



View of east abutment from upstream channel



Severe erosion behind southeast abutment



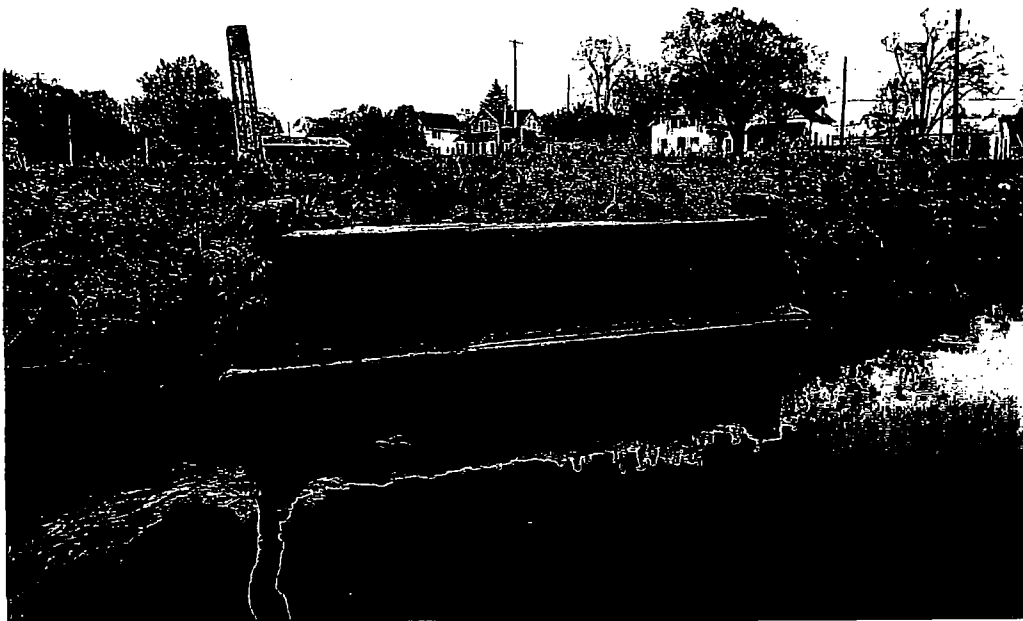
Severely spalled concrete post in the northeast



Severe bank erosion and failed protection in the northeast



Severely spalled concrete post in the northeast



View of the east abutment from the channel



View of the west abutment from the channel



Failed concrete post in the southwest



Failed concrete post in the southwest



Minor honeycombing and abrasion of concrete surface just above the footing



Failed concrete on footing in the northwest



Severe bank erosion in the northwest



Severe erosion behind the northwest abutment

Designation: SA5-D-S05

Location: SA5-D-S05 is located on the east bank of Portage Creek approximately 150' north of Lake Street.

Description: SA5-D-S05 is a 2" steel conduit extending approximately 5' into the channel.

Pre-existing Condition:

- Severe bank erosion appears to have caused the conduit's extension into the channel. The bank is severely undercut in the area.
- The conduit is plugged with debris and appears to be abandoned.

Protective Measures:

- Because the structure appears to be abandoned, it can likely be cut off and plugged at the bank to allow for sediment removal.



View of the structure from the channel with severe root growth and bank undercutting



Close-up of the end of the conduit plugged with debris

Designation: SA5-D-S06

Location: SA5-D-S06 is located on the west bank of Portage Creek at the EQM stone access pad.

Description: SA5-D-S06 is a 10" concrete storm sewer outlet, apparently from a previous development.

Pre-existing Condition:

- The end section of pipe has failed from severe bank erosion and the second section is exposed ~18-24".

Protective Measures:

- Remove the failed end section and install an isolation cofferdam with approximately 2' clearance. Because the outlet appears to be from previous development and not active, it may be possible to eliminate the isolation cofferdam and use caution to avoid undermining the structure.



View of the structure from the channel



End section failed from severe bank erosion



Separation between failed end section and current outlet

Designation: SA5-D-S07

Location: SA5-D-S07 is located on the west bank of Portage Creek approximately 50' north of the EQM stone access pad.

Description: SA5-D-S07 is an 8" concrete storm sewer outlet, apparently from a previous development.

Pre-existing Condition:

- The end section of pipe has failed from severe bank erosion.
- The outlet does not appear to be active.

Protective Measures:

- Remove the failed end section. Because the outlet does not appear to be active, an isolation cofferdam is likely not required. The outlet is located far enough above the waterline in the bank that undermining is not a significant concern.



View of the structure from the channel



End section failed from severe bank erosion



View of the structure from the downstream channel

Designation: SA5-D-S08

Location: SA5-D-S08 is located on Portage Creek at Upjohn Park, approximately 50' north of the confluence with Axtell Creek.

Description: SA5-D-S08 is a prefabricated weathering steel pedestrian truss bridge (Steadfast) on older concrete abutments. The structure has timber boardwalk-type approaches.

Pre-existing Condition:

- Moderate bank erosion was noted around the southeast abutment. Roots from large stumps are holding the west banks.
- The top corners of the abutments are spalled throughout.
- The channel bottom is approximately 5' below the bottom chord of the truss. Logs and trash were noted in the northeast channel.
- The truss is weathering steel and has developed its patina, but minor pitting was noted.
- The timber decking has moderate weathering and splitting of planks throughout.

Protective Measures:

- Construction records are not available for this structure, however it is suspected that the abutments are supported on spread footings several feet below the current channel bottom. We understand that the steel truss is to be temporarily removed to accommodate sediment removal. In this case, a cofferdam is recommended around each abutment to protect them from undermining. Because of the suspected depth of footing, it may be possible to begin sediment removal without cofferdams and install them only if the sediment removal is required below the bottom of footing elevation.
- If the truss is not removed, a simple isolation cofferdam across the channel is recommended upstream and downstream a minimum of 2' clear of the abutments.



Elevation view of the structure from the upstream channel



Bank erosion in the southeast



Spalling on the southeast abutment



Spalling on the southeast abutment



Spalling on the east abutment



Minor pitting on steel at the southeast bearing



Abutment spalling in the northeast



Bank erosion around northeast abutment



Overall view of the west abutment



Northwest bank stabilized by roots



Southwest bank stabilized by roots



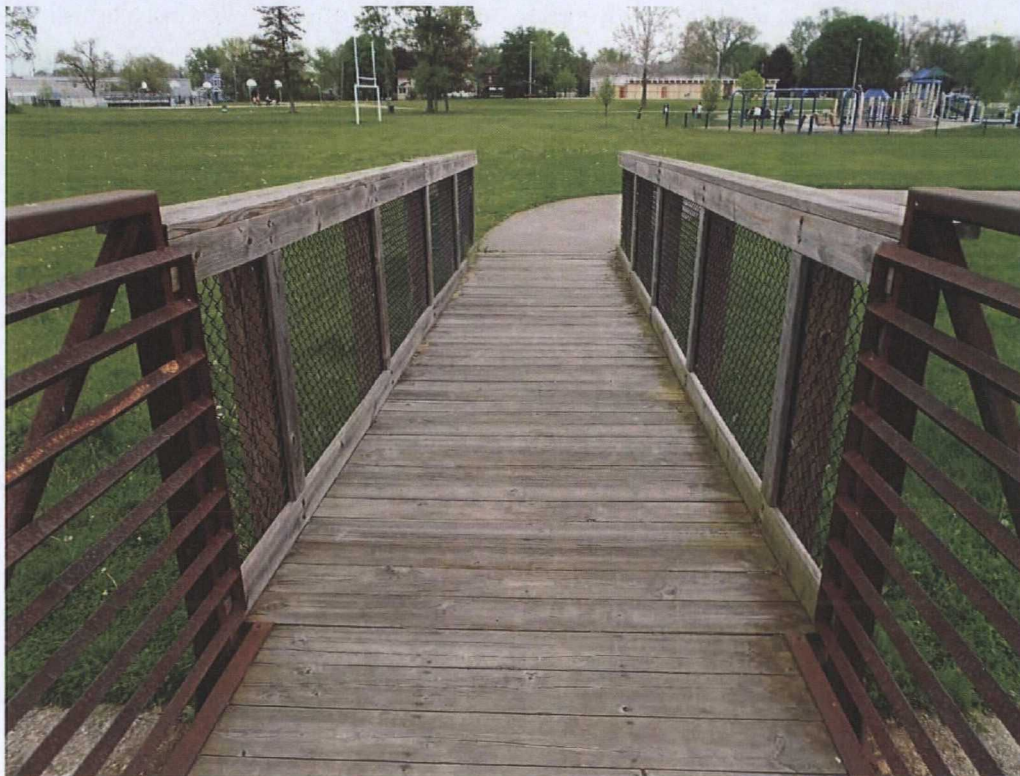
West approach boardwalk



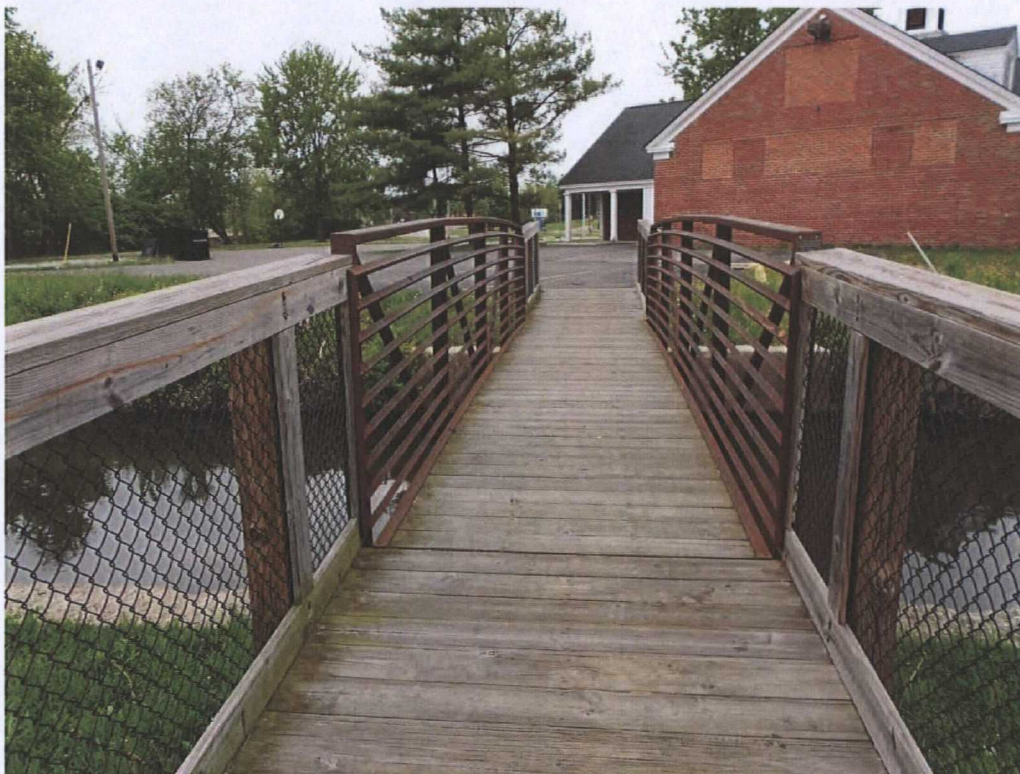
Bridge plate obscured by approach railing



Weathering and splitting of timber deck planks



View of the east approach boardwalk



View of the structure from the east approach

Designation: SA5-D-S09

Location: SA5-D-S09 is located on the east bank of Portage Creek approximately 25' north of the Upjohn Park pedestrian bridge.

Description: SA5-D-S09 is an 8" corrugated plastic storm sewer outlet.

Pre-existing Condition:

- Moderate bank erosion has exposed ~12-18" of the pipe, however, the pipe is set back approximately 2' from the water's edge in an area where the bank is low.
- The pipe appears to be in good condition with no significant deterioration noted.
- The outlet is slightly undermined.

Protective Measures:

- Because the structure is set back from the water's edge, further undermining is not a significant concern. However, undermining should be repaired if it does occur.
- At the time of evaluation, the outlet had a small flow of water and an isolation cofferdam is recommended for dewatering.



View of the outlet from the channel



Small flow of water from outlet

Designation: SA5-D-S10

Location: SA5-D-S10 is located on the banks of Portage Creek approximately 100' north of the Upjohn Park pedestrian bridge.

Description: SA5-D-S10 is a set of pipe bollards filled with concrete. There is a capped 2" steel conduit near the east bollard. The structure appears to be the remains of a previous above-grade natural gas main crossing.

Pre-existing Condition:

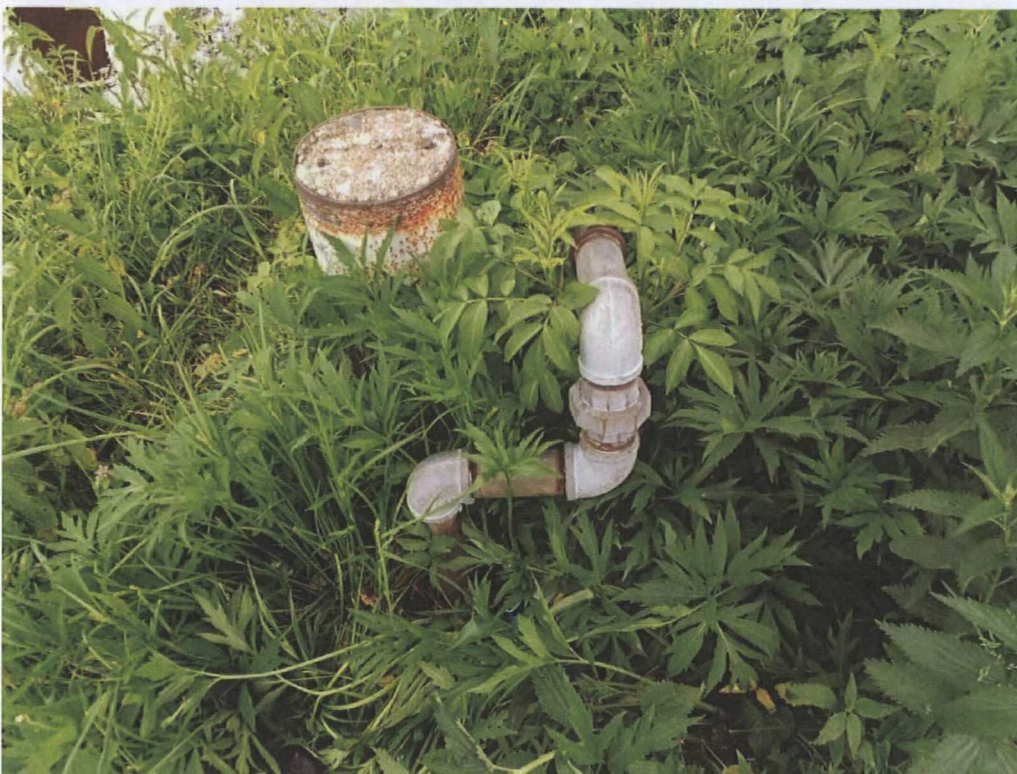
- Both bollards have minor surface corrosion and are overgrown with vegetation.
- The east bollard is set back approximately 4' from the water's edge behind a large tree. The west is located approximately 1' from the water's edge.

Protective Measures:

- The bollards and conduit should be protected from damage during excavation operations by installing construction fencing or other means to make operators and drivers aware of their location.
- The west bollard can likely be removed if it conflicts with excavation operations, however the east one should be avoided to prevent impacting the suspected abandoned gas main.



East bollard and suspected abandoned gas main



East bollard and suspected abandoned gas main



View of west bollard from channel



View of west bollard from bank

Designation: SA5-D-S11

Location: SA5-D-S11 is located on the west bank of Portage Creek approximately 100' north of the Upjohn Park pedestrian bridge.

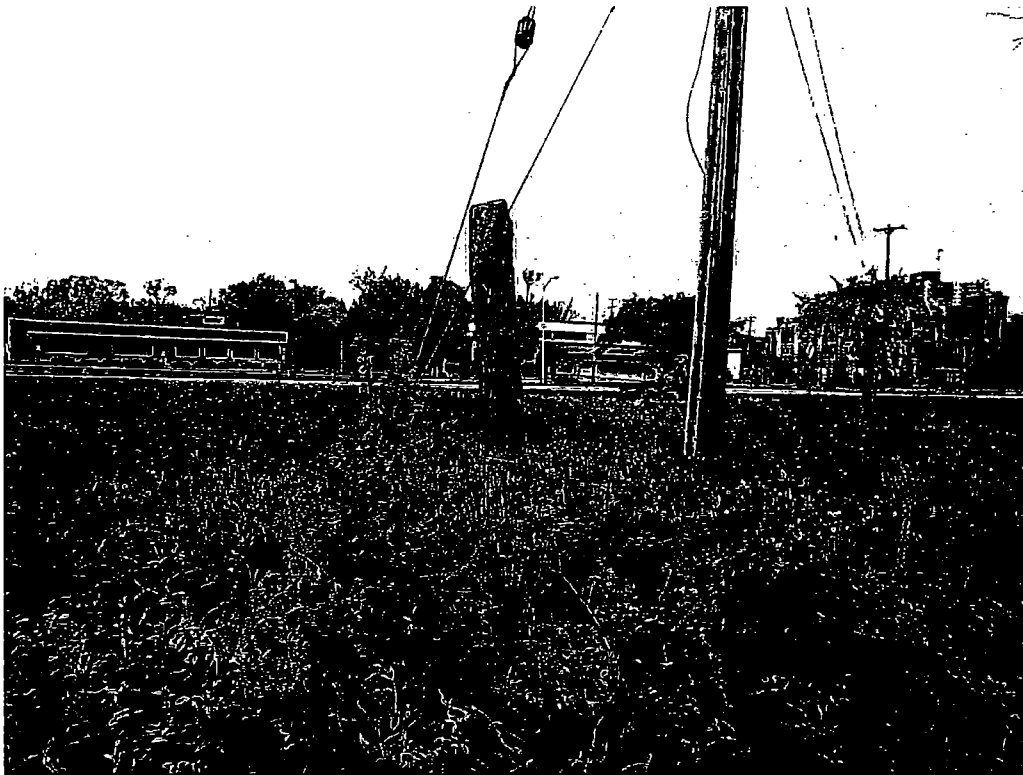
Description: SA5-D-S11 is a utility pole and guy wire. Overhead electric runs parallel to Portage Creek toward Crosstown Parkway.

Pre-existing Condition:

- The pole and guy are located approximately 10-15' from the water's edge.
- There is a tree stump grown around the guy wire.

Protective Measures:

- Because of their distance from the excavation area, the pole and guy will not be impacted by the excavation itself, however, they should be protected with construction fence or similar to make operators and drivers aware of their location.



View of pole and guy looking north



Overall view of the overhead electric facility

Designation: SA5-D-S12

Location: SA5-D-S12 is located in the channel of Portage Creek, approximately 6' from the east bank and 125' north of the Upjohn Park pedestrian bridge.

Description: SA5-D-S12 is a pair of 1" steel pipes, apparently the remains of a pier structure.

Pre-existing Condition:

- There appears to be additional pier debris in the channel around the pipes.
- The steel pipes are leaning slightly and have signs of early corrosion near the waterline.

Protective Measures:

- Remove the pipes and other pier debris in conjunction with excavation work.



View of the structure from the upstream channel



Close-up of steel pipe

Designation: SA5-D-S13 / SA5-C-S01

Location: SA5-D-S13 / SA5-C-S01 is the Crosstown Parkway bridge over Portage Creek. The bridge forms the dividing line between SA5-D and SA5-C.

Description: SA5-D-S13 / SA5-C-S01 a twin corrugated steel plate arch culvert structure with stone headwalls and wingwalls. Although plans for this structure are not available, it is suspected that the arch culverts bear on a spread concrete footing several feet below the channel bottom. The structure carries the asphalt pavement, concrete curb and gutter and concrete sidewalks and has steel panel railings.

Pre-existing Condition:

- Moderate erosion was noted behind the southwest wingwall with concrete rubble placed as riprap. Cracking and gaps were noted in the mortar joints.
- There is a significant amount of woody debris caught on the upstream face of the structure. The debris is reducing the flow in the west pipe, causing high velocities and deepened channel in the east pipe.
- There is severe horizontal cracking in the south headwall, approximately ½" wide from the high point of both culverts heading west. Scattered vertical cracking was noted as well.
- Minor surface corrosion was noted on the culverts above the waterline and moderate to severe corrosion with scaling at the waterline.
- There is a large tree growing at the end of the southeast wingwall. The southeast wingwall has minor gaps and cracks in the mortar joints. There is a large sinkhole behind the wall filled with concrete rubble.
- Minor sagging was noted in the culvert pipes below the roadway. Minor corrosion was noted at the joints between plates, severe in spots.
- The surface is newer asphalt, concrete curb and gutter. There are newer concrete sidewalks between the curbs and headwalls.
- The railings are concrete posts with steel panels. Minor weathering of the posts was noted. The northeast quadrant has approach guardrail.
- Street light poles were noted in the southwest and northeast.
- There is an unidentified steel cover in the northwest and an abandoned conduit on the north headwall.
- Severe erosion was noted around the northwest wingwall with failed concrete rubble placed as riprap. Minor gaps and cracks were noted in the mortar joints.
- The north headwall has moderate to severe step cracking in the northwest with vegetation and severe horizontal / step cracking in the northeast up to ½" wide.
- The channel has deepened in the northeast however no footing was detected.
- Minor gaps and cracks were noted in the northeast wingwall mortar joints. The wall is overgrown with vines. Moderate erosion was noted behind the wall.

Protective Measures:

- The wingwalls and headwalls are masonry-type construction with various degrees of cracking and are more susceptible to damage from vibration than concrete. Therefore it is recommended that the cofferdams at the Crosstown Parkway bridge be constructed of sand bag walls, placed with approximately 4' clearance from the walls.
- The unidentified steel cover in the northwest should be excavated and opened prior to cofferdam installation to check for a possible utility crossing.



Elevation view of the structure from the upstream channel



View of the structure from the southeast approach area



Bank erosion around southwest wingwall with concrete rubble riprap



Cracking and gaps in mortar joints of southwest wingwall



Woody debris caught on upstream face of structure



Severe horizontal cracking in southwest headwall



Close-up of cracking in southeast headwall



Minor sagging of culvert under roadway



Corrosion and scaling of steel plate along waterline



Vegetation growth through cracking in south headwall



Horizontal cracking in southeast headwall



Tree growth at end of southeast wingwall



Sink hole filled with concrete rubble behind southeast wingwall



Corrosion and scaling of steel plate along waterline in southeast



View of south sidewalk and railing



Approach guardrail in the northeast



Corrosion on end of northeast approach guardrail



Unidentified steel cover in northwest



Abandoned conduit on north headwall



Bank erosion around northwest wingwall



Bank erosion around northwest wingwall with concrete rubble riprap



Step cracking in northwest headwall



Horizontal and step cracking in northeast headwall



Step cracking in northeast headwall



Vine growth on northeast wingwall



Bank erosion around northeast wingwall

Designation: SA5-C-S02

Location: SA5-C-S02 is located on the west bank of Portage Creek just north of Crosstown Parkway.

Description: SA5-C-S02 a 12" clay storm sewer outlet from the Jasper Street area.

Pre-existing Condition:

- There are 3 failed sections (~6') in the channel and the 4th exposed approximately 12" from severe bank erosion.

Protective Measures:

- Remove the 3 failed sections. Protect the outlet with an isolation cofferdam to allow for dewatering.



View of structure from the channel



View of structure from the upstream channel



Cracked bell at failed section

Designation: SA5-C-S03

Location: SA5-C-S03 is located on the west bank of Portage Creek approximately 50' north of Crosstown Parkway.

Description: SA5-C-S03 a timber utility pole with overhead lines parallel Portage Creek.

Pre-existing Condition:

- The pole has a slight offset along its length but otherwise appears to be in fair condition.

Protective Measures:

- Because of its distance from the excavation area (approximately 20'), the pole will not be impacted by the excavation itself, however, it should be protected with construction fence or similar to make operators and drivers aware of its location.



View of pole from channel

Designation: SA5-C-S04

Location: SA5-C-S04 is located on the east bank of Portage Creek approximately 75' north of Crosstown Parkway.

Description: SA5-C-S04 a 12" clay storm sewer outlet from the Crosstown Parkway or northern Upjohn Park area.

Pre-existing Condition:

- The end of the pipe is exposed ~12" from bank erosion in the area. It is severely cracked and scaled.
- The concrete collar around the pipe is severely spalled.

Protective Measures:

- Install a cofferdam to protect the structure and allow for dewatering. Provide approximately 2' clearance from the pipe.



View of structure from the channel



Cracking and scaling of end section and spalled concrete collar

Designation: SA5-C-S05

Location: SA5-C-S05 is located on the west bank of Portage Creek approximately 100' north of Crosstown Parkway.

Description: SA5-C-S05 a 15" clay storm sewer outlet from the Jasper Street area with concrete headwall.

Pre-existing Condition:

- Severe bank erosion has exposed the pipe behind the headwall on the south side and nearly exposed it on the north side. The bank is cut approximately 2' behind the headwall.
- No significant deterioration was noted on the pipe or headwall.

Protective Measures:

- Install a cofferdam to protect the structure and allow for dewatering. Provide approximately 2' clearance from the headwall.



View of structure from the channel



Close-up of the concrete headwall



Bank erosion exposing clay pipe on the south side



Bank erosion around north side of headwall

Designation: SA5-C-S06

Location: SA5-C-S06 is located on the west bank of Portage Creek approximately 125' north of Crosstown Parkway.

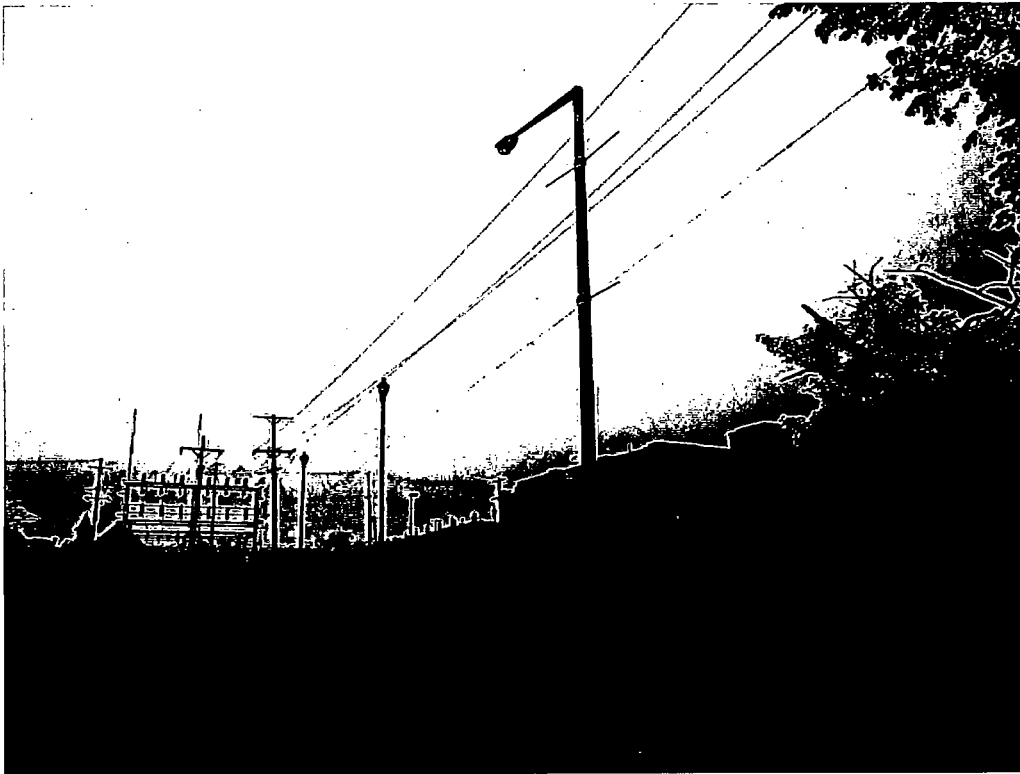
Description: SA5-C-S06 is a cobra head style light pole for Jasper Street.

Pre-existing Condition:

- No significant deterioration was noted.

Protective Measures:

- Because of its distance from the excavation area (approximately 15'), the pole will not be impacted by the excavation itself, however, it should be protected with construction fence or similar to make operators and drivers aware of its location.



View of the pole from the channel

Designation: SA5-C-S07

Location: SA5-C-S07 is the overhead electrical crossing of Portage Creek between Crosstown Parkway and Vine Street.

Description: SA5-C-S07 is an overhead electrical crossing with a timber pole and guy between Portage Creek and Jasper Street.

Pre-existing Condition:

- No significant deterioration was noted.

Protective Measures:

- Because of their distance from the excavation area (approximately 13'), the pole and guy will not be impacted by the excavation itself, however, they should be protected with construction fence or similar to make operators and drivers aware of their location.



View of the pole and guy from the channel



View of the pole and guy from the bank



View of the crossing from the timber pole

Designation: SA5-C-S08

Location: SA5-C-S08 is located on the west bank of Portage Creek at the overhead electrical crossing between Crosstown Parkway and Vine Street.

Description: SA5-C-S08 is an unidentified concrete post along the water's edge.

Pre-existing Condition:

- The concrete surface has minor abrasion and scaling.
- The post leans severely toward the channel.

Protective Measures:

- The purpose for the post is unknown and it can likely be removed in conjunction with sediment removal operations.



View of the structure from the channel



Post leaning severely toward the channel

Designation: SA5-C-S09

Location: SA5-C-S09 is located on the east bank of Portage Creek just south of Vine Street.

Description: SA5-C-S09 is a series of concrete slabs installed as bank protection.

Pre-existing Condition:

- The concrete is abraded at the waterline with severe cracking and settlement of the slabs.
- There is significant vegetation growth between the slabs and through cracks.
- There is a significant amount of failed rubble in the channel along the toe of the bank.

Protective Measures:

- Remove and replace the slabs as required to facilitate cofferdam installation and sediment removal.



View of the structure from the channel



Vegetation growth through the structure



Vegetation growth through the structure



Cracking and vegetation growth through the structure



Vegetation growth and abrasion along the waterline



View of the structure from the upstream channel

Designation: SA5-C-S10

Location: SA5-C-S10 is located on the west bank of Portage Creek just south of Vine Street.

Description: SA5-C-S10 is a concrete rubble wall with storm sewer outlet penetration.

Pre-existing Condition:

- The 12" concrete storm sewer outlet is severely abraded/spalled exposing the steel reinforcement.
- Slabs have severe cracking and settlement, approximately 2" at the southwest concrete wingwall of the Vine Street bridge.
- There is significant vegetation growth through the wall.
- The south end has severe bank erosion with a sink hole behind the wall.

Protective Measures:

- Remove and replace the slabs as required to facilitate cofferdam installation and sediment removal or extend the cofferdam around the structure with approximately 4' clearance.
- Protect the storm sewer outlet with a cofferdam to allow for dewatering. Because of its proximity, the cofferdam will likely be part of the cofferdam for the Vine Street bridge.



View of the structure from the channel



Failing slabs at the south end of the structure



Gaps and vegetation growth in the wall



Tree growth in north area of the wall near the storm sewer outlet



Storm sewer outlet through the wall



Settlement of the concrete slabs at the Vine Street bridge

Designation: SA5-C-S11

Location: SA5-C-S11 is the Vine Street bridge over Portage Creek at the north end of area SA5-C.

Description: SA5-C-S11 is a single span bridge with side by side box beams, asphalt wearing surface, concrete sidewalks and concrete parapet railings. The superstructure is carried by cast in place concrete abutments on cast in place concrete piles. The bridge was constructed in 1988.

Pre-existing Condition:

- Scour protection is limited, with scattered concrete rubble below the waterline.
- The channel is currently approximately 4' below the bottom of beam. From the construction plans, the bottom of footing is approximately 8.3' below the bottom of beam and the structure has a subfooting extending approximately 9.8' below bottom of beam.
- Efflorescence and stalactites were noted along several box beam joints.
- The banks are protected by concrete rubble walls in the southeast and southwest.
- There are 2 storm sewer outlets through the west abutment near centerline. There is also a storm sewer outlet through the southeast wall with a manhole in the southeast.
- Scattered hairline cracking was noted in the box beam fascia, primarily at the fascia jack inserts.
- All 4 quadrants are protected with chain link fencing.
- The asphalt surface has block cracking which is mostly sealed in north lane and south wheelpath. Severe transverse cracking, partly sealed, was noted along the reference lines.
- The structure has concrete parapet railings with no approach guardrails. Scattered minor vertical cracking was noted on the railings.
- There are several overhead utilities crossing east-west over the south sidewalk. Hairline to minor map cracking was noted in the south sidewalk.
- The approach sidewalk has minor settlement at the structure, approximately 1/2".
- There is a storm manhole in the southwest as well as an electric vault along Jasper Street.
- A water main gate valve was noted in the northwest sidewalk. The water main crosses Portage Creek suspended along the north fascia.
- There is a light pole in the northwest, which is leaning, along with a fire hydrant and irrigation equipment.
- Minor spalling was noted in the northeast sidewalk and the approach sidewalk has settled approximately 1".
- Severe to critical spalling to steel was noted on a railing post near midspan, north side.
- There is severe brush growth through the northwest wall.
- A concrete rubble wall supports the northwest bank and a concrete retaining wall supports a parking lot area in the northeast. The construction plans indicate a 12" storm sewer outlet through the location of the concrete rubble wall in the northwest, however it was not detected during evaluation and may have been rerouted.

Protective Measures:

- Because of the bridge's depth of footing and pile support, this structure will not be impacted by the sediment removal operation itself or vibration from sheet pile cofferdam installation. However, the adjacent concrete rubble walls are more susceptible to damage from vibration and likely do not extend below the bottom of the sediment excavation. Therefore, these structures should either be removed and replaced in kind or protected with a sand bag cofferdam. A 4' clearance between cofferdam and face of wall is recommended.
- The concrete retaining wall in the northeast is less susceptible to damage from vibration and likely has a footing at least several feet below the bottom of the channel. A sheet pile type cofferdam should be acceptable with a 4' clearance, however, the gap between the wall and the end of the sheet pile will need to be sealed with sand bags or similar, therefore a complete sand bag wall may be preferable.
- There is an 8" sanitary sewer crossing approximately 10' north of the northeast abutment and 25' north of the northwest abutment. It is a ductile iron pipe beneath the channel and clay beyond. Comparison of the bridge plans to the utility plans indicate the top of pipe is approximately 6.5' below the bottom of beam, which would indicate approximately 2.5' of cover. It is recommended that the manholes on either side of the crossing be used to establish its line and opened to confirm its depth. If the main falls within the excavation area and within 12" of the excavation depth, it should be hand excavated or the area avoided. A minimum clearance of 4' is recommended for driving sheet pile near the crossing, if required.
- During evaluation, equipment was not available to access the electric vault in the southwest quadrant along Jasper Street. Mapping of the area's electric facilities have been requested but are not yet available. Therefore, it is recommended that the vault be opened prior to work in the area to check whether there are underground facilities suspected of crossing beneath the channel in this area. Utility mapping will be reviewed when it is received and an update provided.



Elevation view of the structure from the upstream channel



View of the structure from the southeast approach area



Efflorescence and stalactites along box beam joint



Storm sewer outlet through the southeast abutment



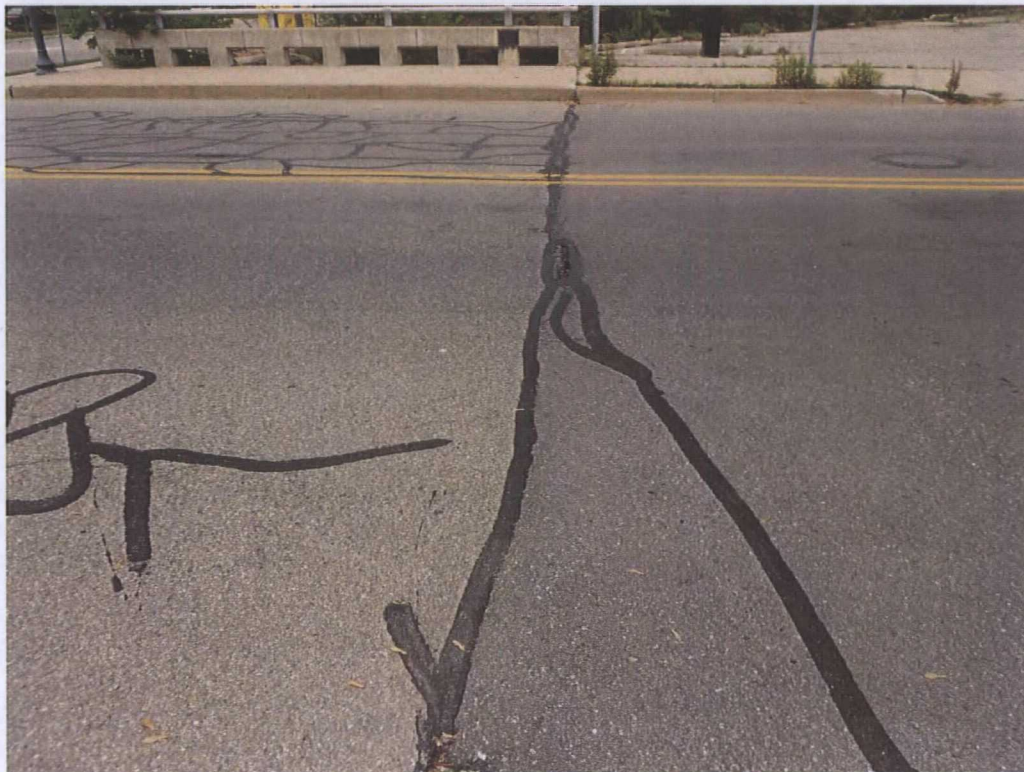
Bank erosion around the southeast abutment



View of structure from the southeast slope



Storm sewer manhole in the southeast



Partially sealed cracking in the asphalt surface



Storm sewer manhole in the southwest



Electric vault in the southwest



Electric vault in the southwest looking northeast



Leaning light pole in the northwest



Water main gate valve cover in the northwest sidewalk



Fire hydrant and irrigation equipment in the northwest



Settlement and spalling of the northeast sidewalk with vegetation growth



Vegetation growth through the northwest concrete rubble wall



Brush growth on the northwest abutment



Severe spalling on concrete post of the north railing



Water main crossing on the north fascia



View of the northeast concrete abutment



View of the northeast concrete abutment with concrete retaining wall beyond (left)

